Economic Concepts Relevant to a Proper Interpretation of the Act

Q. What do economists mean by the term "cost?"

A. In economic terms, the cost to a firm of providing a particular service includes the implicit and explicit expenses associated with securing and providing all of the inputs necessary to provide that service. These include the labor, the material inputs, the managerial expertise, the fixed and variable assets including capital assets, the land, the computer hardware and software, and all other inputs used in the provision of the service. The cost to the firm of employing labor, for example, is the cost of wages, employee benefits, training, and any other expense associated with or caused by their employment. Similarly, the cost of acquiring capital assets must include the cost of attracting the financial capital to finance the acquisition. The cost of attracting financial capital is sometimes referred to as the cost of money.

Q. What is meant by the "cost of money?"

A. The cost of money is one component of the overall capital cost[1]. The production or purchase and installation of an asset that is long-lived requires an investment of financial capital. Financial capital is secured through either the debt (bond) market

[1] The other components are depreciation and income taxes. In the ICC Cost of Service rules, the cost of money is referred to as the "cost of capital (return)." Section 791.20 Part (f).

or the equity (stock) market, or, typically, both. Investors are willing to put their money at risk only to the extent that they anticipate that their investment will generate returns that meet or exceed the expected return to alternative investments of similar risk. The cost of money is the return that the firm must pay, on average, in order to attract funds away from other investment opportunities.

Q. How is the cost of money calculated at Ameritech?

A. The cost of money is a weighted average of the cost of equity and the cost of debt (60% equity, 40% debt for Ameritech). The cost of debt financing is the interest payments that the firm must make to its bond holders, lenders, or other holders of debt instruments. The cost of equity is determined from the returns to all telecommunications providers of local exchange services. This methodology is consistent with that prescribed by the ICC Cost of Service rules, Section 791.80, Part (b)(2).

Shareholders receive compensation for their equity investments through dividend payments and through appreciation of the value of the stock, which is driven by the expected profitability of the firm. Because shareholders demand that they receive a reasonable return on their investment, through dividends and/or share appreciation, both dividend and share appreciation are means of providing returns to equity investors.

Q. According to standard economic principles, why is the cost of money considered a cost rather than a profit?

A. A firm cannot attract financial capital, and therefore cannot finance its investments in plant, equipment, network, and other long-lived assets, unless investors have a reasonable expectation of earning a return that is competitive with investments of similar risk. If the comparable market return is, say 10%, then investors must reasonably expect a return of at least 10% from this investment or they will direct their investments elsewhere. Hence, returning 10% to the investors is a cost of doing business.

This point is illustrated in Edgar K. Browning and Jacqueline M. Browning's Microeconomic Theory and Applications, a leading economics textbook:

> For the modern large corporation the most important implicit cost is associated with the use of the firm's productive assets, its capital. These resources are ultimately owned by the stockholders, who have provided investment funds to the corporation and expect to receive a return on their investment....Viewing the rate of return that could be obtained from investment elsewhere as an implicit cost means that an average return on investment is treated as part of the firm's normal production costs.[2]

[2] Browning, Edgar K., and Browning, Jacqueline M. Microeconomic Theory and Applications, Fourth Edition, New York: HarperCollins Publishers Inc., 1992.

Q. Does the ICC recognize the cost of money as a cost to telecommunications carriers?

A. Yes, it does. In Section 791.20, Part (j), of the ICC Cost of Service rules, capital costs are defined as the "recurring costs that result from expenditures for plant facilities which are capitalized. These annual capital costs include depreciation, cost of capital (return), and income taxes." All three components of capital costs are defined to be costs, including the "cost of capital (return)" which, in order to clearly distinguish this element of capital costs, I am referring to as the cost of money.

Q. Why does it matter whether the cost of money is defined as a cost or a profit?

A. In a market setting, the *market* treats the cost of money as a cost. Firms cannot survive if they consistently fail to satisfy investors' expectations of a return that is competitive with investments of similar riskiness, or if they fail to meet debt obligations. So covering the cost of money is necessary for long term survival, just as it is necessary to cover any other cost.

In a regulated setting, the importance of the definition is direct. If the regulatory authority refused to recognize the cost of money as a cost, and thereby prohibited firms from recovering the cost of money in their prices, such firms would be unable to attract capital to finance investment and would be unable to cover their bond

indebtedness commitments. In the short run, such a firm will be unable to invest in upgrading and maintaining the quality of its plant and equipment, and in the long run will not remain viable.

Costs of a Telecommunications Firm

Q. What are the costs in a telecommunications firm that are relevant to the pricing standard in the Act?

A. The total costs of a telecommunications firm, like any multiproduct firm, can be thought of as falling into four categories. First are the Long Run Service Incremental Costs (LRSICs) of providing each of the individual services of the firm. These are defined in Illinois in the Illinois Commerce Commission's cost of service rules at 83 Illinois Administrative Code, part 791. The LRSIC of any service X includes all the costs of capital, labor, materials, and other costs that are caused by the provision of service X, given all the other services the firm is also providing. Looked at differently, it is the costs that the firm would save if it stopped providing service X entirely but continued to provide all its other services at their current levels. At Ameritech, for example, the LRSIC for the custom calling feature, Call Waiting, would include switch processing, advertising, feature input, billing, and service order training. The cost associated with the Right-to-Use (RTU) fee or software program would not be included because the switch software program for Call Waiting functionality is purchased in a package with other feature software. The RTU fee would not be included in the LRSIC of any

individual service provided by Ameritech because the RTU fee would not be eliminated by ceasing to provide any single Ameritech service.

Q. What is the second category of costs?

A. The second category of costs is joint costs, which, in the terminology of the ICC Cost of Service rules, are called "shared" costs.[3] Shared, or joint, costs are those that are necessary to the provision of a group or family of services, but are incremental to no one service individually, and could be avoided only by eliminating the entire group or family of services. As with LRSIC, joint costs include the cost of inputs associated with the provision of a group or family of services. For example, the RTU fee is a joint cost of providing the family of services including Call Waiting and other custom calling functionalities, such as Call Forwarding, that are governed by the same software package. Another example is the cost of the manager who oversees the provision and marketing of the custom calling services. If Ameritech ceased offering any one feature, a manager would still be employed to market and oversee the other custom calling services.

The inputs that are shared within a family of services and categorized as joint costs are different from those that are assigned to the LRSIC of a specific service (or

[3] ICC Cost of Service rules, Sections 791.20 (f) and 791.80 (g).

those assigned to any other cost category). In other words, each specific asset, man-hour, and so forth is counted in only one category of cost.

Q. What is the third category of costs?

A. The third category of costs is common costs, sometimes referred to as common overheads. Common costs are the cost of any capital, labor, materials, and other costs associated with the operation of the firm as a whole, but are incremental to no individual service, nor are they joint costs of any specific group or family of services. The company's payroll system, building rent for the corporate headquarters, and non-service-specific advertising are all examples of common costs. The difference between joint and common costs is that joint costs could be avoided if a single family of services were eliminated, but common costs could only be avoided if the entire firm ceased operation.

Q. What is the fourth category of costs?

The fourth cost category is what I am calling "other" costs. These include the cost of assets that are on the books but have been underdepreciated relative to their economic lives. When assets are depreciated on the books at a slower rate than their economic depreciation, there will be some time during which they will remain on the books as a cost when they are no longer generating value.

In addition, "other" costs include the incremental costs of a service that are not included in the LRSIC calculation. LRSIC is not an estimate of the actual incremental cost to Ameritech of providing a service, but the cost that would be incurred if the service were provided under the most efficient available forward-looking technology. A real network is not rebuilt at each point in time to take advantage of improved technology; it is built bit by bit over time, and encompasses multiple generations of technology. Each investment decision may have been efficient and foresighted when it was made, but the resulting network will not be the same as the one that would be built today if it were reconstructed under the best forward looking, currently available technology. Hence, the current cost of the facilities devoted to a particular service will often exceed the LRSIC. The difference between the LRSIC and the actual incremental cost is another legitimate cost that would not fall in the LRSIC, joint, or common categories.

Q. In which category of costs are the costs of money?

In general, all categories of cost, LRSIC, joint, common, and other, could contain labor, materials, and capital costs, including the cost of money. There may be a cost of money component in each cost category because each category may include some capitalized assets.

Q. Can you provide an illustration of the cost structure you are describing?

A. Yes, such an illustration is contained in Exhibit 5.1, which is attached to my testimony. The exhibit portrays the hypothetical costs of a multiproduct firm. In this simple example, a grocery store has two departments, meat and milk. The meat department has two sub-departments, beef and poultry. Each of the three final products, beef, poultry, and milk, has a LRSIC associated with it, which derives from the labor, capital, and direct input costs associated with providing each individual product, given the provision of the other two. Beef and poultry are provided in the same department, so there are joint costs associated with the butcher and with the butchering equipment. The cost of the butchering equipment is an (annualized) capital cost, and includes a cost of money. None of these joint costs are included in the LRSICs of the beef or poultry, nor are they included in the common costs of the store. The common costs of the store reflect the capital costs of the building and parking lot, the labor of the cashiers and manager, and so forth. Again, these costs are not part of the calculation of the LRSICs of any product, nor are they part of the joint costs of the meat department.

Although Ameritech is obviously a far more complex organization than the simple grocery store in the example, the principles underlying the categorization of costs are similar. Typical firms, including Ameritech, produce many products, and have LRSIC, joint, and common costs of production, each of which reflects specific assets and inputs into production of the final goods and services. Just as the

grocery store could not efficiently do business without its cashiers and building, so will any multiproduct firm, such as Ameritech, incur joint and common costs. Moreover, the example makes apparent the fact that, for simple as well as complex firms:

- Total LRSICs do not account for the total costs of the firm.
- Total costs of money within the LRSICs do not account for the total cost of money of the firm.
- Total LRSICs minus their costs of money would not recover even the total costs of labor, capital depreciation, materials, and other non-money costs of the firm.

Q. How does the example illustrate the first point?

A. The total LRSICs of the grocery store are $200,000 + $420,000 + $110,000 = $730,000. The firm's total costs are $1,570,000, so that the LRSICs fall short of the total costs by the amount of the joint and common costs, $840,000.

Q. How does the example illustrate the second point?

A. The total cost of money in the firm is the cost of money associated with capital in each cost category. For the example, the total cost of money is $86,000. The cost of money for the incremental assets is $25,000. The difference is the cost of money associated with the shared and common assets.

Q. How does the example illustrate the third point?

A. In the example, if prices recovered only the LRSICs minus their included cost of money, total revenues would be $730,000 - $25,000 = $705,000. Total costs of the grocery store, *excluding* the cost of money in each category, equal $1,570,000 - $86,000 = $1,484,000. The firm would be incurring a loss of $779,000 *even before* paying to the investors a return equal to the opportunity cost of their investments; it could not even fully cover its labor and materials costs.

Q. Are capital costs double-recovered by including them in both LRSIC and contribution?

A. No. As illustrated in the example of Exhibit 5.1, the costs of capital included in LRSIC relate to the capital assets that are incremental to the service. Any costs of capital included in the other three categories would relate to different capital assets. For example, the computers in the CEO's office would be capital assets included in common costs. Therefore, there is no double counting.

Q. Does the Act recognize joint and common costs as legitimate costs?

A Section 254(k), "Subsidy of Competitive Services Prohibited" requires that the states ensure that: "services included in the definition of universal service bear no

more than a reasonable share of the joint and common costs of facilities used to provide those services." In this phrase I believe that the Congress has acknowledged that both joint and common costs exist and that they must be covered, via a contribution included in service prices.

Q. Some critics have argued that an efficient firm would have no joint or common costs. Do you agree?

A. Absolutely not. The real-world example provided above, of the RTU fees for software that provides functionality for Call Waiting and other call features, illustrates this point. Without the shared RTU software, custom calling features could not be provided.

More generally, some common and joint costs are associated with managerial inputs or coordination tasks that are less obviously, but equally legitimately, economic. Multiproduct firms arise precisely when economies of scope between complementary activities are best exploited by grouping the complementary activities within the boundaries of one organization. The very existence and abundance of multiproduct firms in competitive economies is testimony that they are an efficient response to the costs imposed by arms-length market exchange. The managerial costs associated with organizing and coordinating different activities are not an inefficiency but rather a means of exploiting the efficiencies derived from economies of scope. To disallow joint and common costs would

force these products to be provided separately by individual firms at higher overall costs, because some or all of these costs would have to be duplicated for the production of each product separately. The inefficiency of this arrangement would necessarily be borne by consumers, in the form of higher prices or lack of services.

The Economic Meaning of Profits, and the Meaning of "Reasonable Profit" Under the Act

Q. How do economists define the term "profit"?

A. Economic profit is the excess in revenues over and above the total economic costs (i.e., incremental, joint, common and other costs) of the firm. Economists say that a firm makes a (positive) economic profit if its revenues exceed the total costs of operation, where those costs include not only the costs of labor, materials, and so forth, but also the cost of capital, including the cost of money. A firm whose revenues just equal the total economic costs of the firm, including the cost of money, is said to earn "zero profits." A firm that earns zero profits pays a normal, or "average," return to its investors. In our example above, a firm that paid investors 10% on their investment (i.e., covered its cost of money), and covered all other costs of the firm, would be said to earn a zero profit. The investors would have made a return on their investment that was just equal to the opportunity cost of their funds, all other costs of the firm also having been covered.

Q. Why does covering LRSIC generally not yield a profit for a firm?

A. Covering LRSIC (even including the required return on LRSIC-related investments) would not recover all of the non-incremental costs of the firm, including the labor, materials, and capital costs, including the cost of money, associated with any joint, common, and other costs. Hence, for both of these reasons, and contrary to the assertion of one witness in this proceeding (Dr. Ankum), the fact that a cost of money is (properly) built into the LRSIC of each product does not imply that covering LRSIC would generate a profit for the firm.

Q. In light of the standard economic principles you have articulated, what is meant by the phrase in the Act "reasonable profit"?

A. First it should be noted that when there are joint and common costs, it does not make sense to talk about profits on a product-by-product basis. Profit is the excess in the firm's *total* revenues over the firm's *total* costs, taking into account all costs, including the cost of money.

There are two possible interpretations of "reasonable profit." One interpretation could be that the firm's profit is limited to a zero economic profit, or a "normal" profit. In this case, the firm would cover its common, joint, LRSIC, and other costs in the prices for its services, and investors would be restricted to a return no greater than the opportunity cost of money that is included in those costs. According to standard economic theory, in a long run competitive equilibrium in a

static market, the least efficient firms in the industry would earn zero economic profits.[4]

However, even in a competitive market, unusually efficient firms will earn positive economic profits; firms with successful innovations will earn positive profits; and if costs unexpectedly fall or demand unexpectedly rises, all firms in the industry may temporarily earn positive economic profits. There is typically considerable variability within competitive industries in the profitability of firms. Some firms, due to their success in innovation, highly competent management, unusually productive assets, fortunate location, or some other ability to create a competitive advantage and high value for consumers, earn positive economic profits. We can find several examples of companies who surpass the industry average rate of return due to innovative technologies or efficiencies. For example, in the computer and information industry, the industry one, three and five year average stock returns were 40.4%, 22.1% and 27.9% respectively. Although several companies outperformed the industry average, one company in particular, 3Com Corporation, consistently surpassed the industry average with 80.9%, 84.6% and 87.7% average returns for one, three and five years. The fact that this firm consistently outperformed its peers in its own market suggests that it was earning a positive economic profit. Another example can be found in the footwear industry. The average one, three and five year stock returns in this industry were 1.7%, -7.6%

[4] Katz, Michael L. and Rosen, Harvey S., Microeconomics, Second Edition. Burr Ridge, IL: Irwin, 1994, pp. 360-365.

and 9.2%. Nike Inc., one of the few companies in the industry with positive returns year after year, had one, three and five year average returns of 88.6%, 20.4% and 29.7% respectively. Nike, Inc. is an example of a company that has outperformed all of its competitors by creating exceptional value for consumers. Similar examples can be found in the airline, banking, communications, and retail industries.

Hence, if a firm is unusually efficient, successful at innovation, or is benefiting from positive fluctuations in the market such as a surge in demand, "reasonable" profits will exceed a "normal" profit. The economic profits earned by shareholders are the reward they get for successful innovation. Without the potential for such rewards (which would exceed a return on equity as might be calculated for a regulatory proceeding), investors have no incentive to risk their capital in R&D activities, and consumers would be deprived of the benefits of innovation.

Q. How does the Act's provision that the firm may earn a reasonable profit relate to the inclusion of contribution in service prices?

A. Under either possible economic interpretation of profits, "reasonable profit" must include recovery of all categories of costs, including any costs of money associated with each category (LRSIC, joint, common, and other).

Pricing of Network Elements

Q. What do you recommend as the proper benchmark for recovering contribution from different network elements?

A. The contribution included in the price of an unbundled bottleneck component should be comparable in amount to the contribution included in the bundled service of which it is a part. The contribution carried by a combination of unbundled components should, together, also be comparable in amount to the contribution included in the bundled service. If any of these components is competitively supplied, the price of the component should be reduced to the competitor's stand-alone cost of providing the component. This not only implements proper incentives for efficient bypass, but it also imposes the proper competitive pressures on inefficient firms.

Q. How would the efficient prices be determined if there are additional costs for unbundling?

A. As a matter of economic efficiency, any cost caused by unbundling should be recovered in the prices of the unbundled elements.

Summary and Conclusions

Q. Could you please summarize your testimony?

A. Standard economic principles provide clear guidance as to the interpretation of the pricing standards in the Act. Costs must be understood to include the cost of money, and recovery of costs must therefore include recovery of the cost of money. Prices should be set based on LRSIC as a price floor, with contribution toward non-incremental costs included in the prices of unbundled network elements. In order to earn a reasonable profit, Ameritech must be able to at least recover all of its costs, including its joint, common, and other costs, and including all of the costs of money. This would generate a zero economic profit, which is the minimum for viability of the firm. Profits above this level would be reasonable if they are associated with enhanced efficiency, successful innovation, or other firm characteristics that render the firm unusually productive.

Q. Does this complete your testimony?

A. Yes, it does.

DISTRIBUTION OF LRSIC, JOINT AND COMMON COSTS FOR A HYPOTHETICAL GROCERY STORE

COMMON COSTS FOR ALL SERVICES

LABOR: Cashiers: $140
CAPITAL: Parking lot and grocery carts: $250 (COM included = [illegible])
Store space: $380 (COM included = $35)
TOTAL: $770

JOINT COSTS FOR POULTRY & BEEF

LABOR: Butcher: $40
CAPITAL: Knives and slicing machines: $30 (COM included = $3)
TOTAL: $70

POULTRY LRSIC
Wholesale poultry costs, delivered: $100
CAPITAL: Poultry refrigeration units and refrigerated display: $100
(COM included = $9)
TOTAL: $200

BEEF LRSIC
Wholesale beef costs, delivered: $300
CAPITAL: Beef refrigeration display: $120
(COM included = $11)

TOTAL: $420

MILK LRSIC
Wholesale costs of milk: $50
CAPITAL: Refrigeration units: $60
(COM included = $5)

TOTAL: $110

Calculation of TOTAL COST: $770 + $70 + $200 + $420 + $110 = $1,570

Total LRSIC: $200 + $420 + $110 = $730

Total cost of money: $23+ $35 + $3+ $9 + $11 + $5 = $86

Total cost of money associated with capital that is incremental to individual products: $9+$11+$5=$25

Note: "COM included" is the cost of money element of the cost of capital, which is included in the capital costs shown.
Costs represent annual costs in 1,000s.